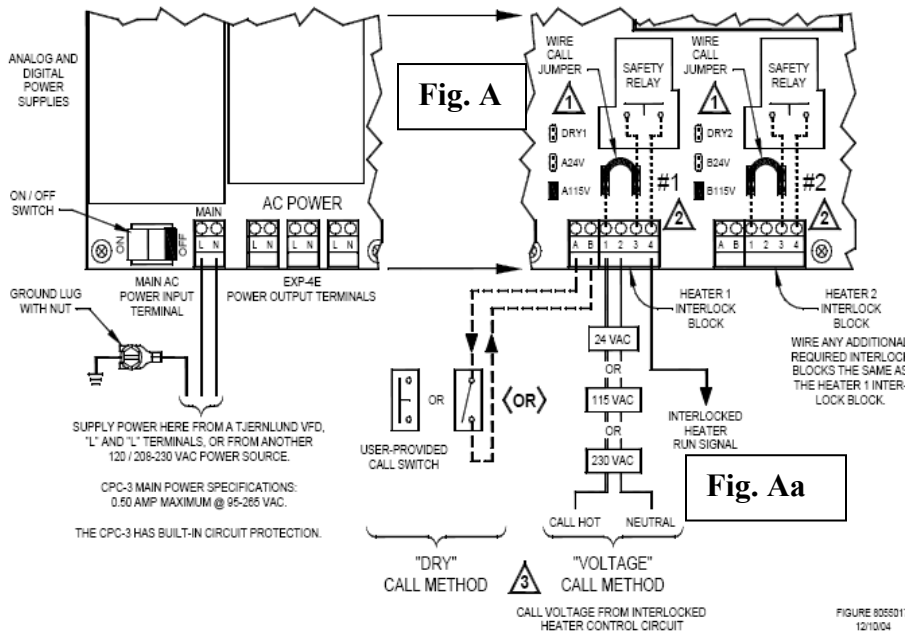


## Tjernlund Interlock Wiring Check List

<b>Mark OK or N/A</b>	<b>Appliance Interlock Performed Task Description</b>	<b>Step</b>
	<p><b>Verify:</b> Appliance Interlock connections</p> <ul style="list-style-type: none"> <li>• Dry Contact signaling uses Terminals A&amp;B</li> <li>• Dry Contact Signaling requires Jumpers to be set to DRY1, DRY2, DRY3 OR DRY4</li> <li>• If the A &amp; B dry contacts are used to activate the CPC-3 (Call return jumper wire must be removed).</li> </ul>	<p><b>1</b></p> <p>Details Page 3 Fig. A</p>
	<p><b>Verify:</b> Dry Contact use auxiliary appliance safety spill switches or other means of lock out on vent system pressure failure.</p> <ul style="list-style-type: none"> <li>• <b>ONLY APPLIANCES INTERLOCKED INTO THE 24-115 VAC APPLIANCE TERMINAL BLOCK POSITIONS (1, 2, 3, and 4) WILL RESPOND TO SYSTEM FAULTS. ANY APPLIANCE WHICH ACTIVATES THE CPC-3 THROUGH THE DRY CONTACT TERMINALS (A&amp;B) MUST ADD AUXILIARY SPILL SWITCHES. SPILL SWITCHES MUST BE WIRED INTO APPLIANCE ECO. 30 MILLIVOLT WATER HEATERS REQUIRE 950-0470 THERMOCOUPLE JUNCTION ADAPTER ALONG WITH SPILL SWITCH (ES). Another option is to tie the 3&amp;4 terminal block positions in series with the heaters high limit/low water cut off circuit. The relay that closes position 3 to position 4 is rated for 15 amps.</b></li> </ul>	<p><b>2</b></p> <p>Details Page 3 Fig. Aa</p>
	<p><b>Verify: 24-115V</b>Appliance Interlock connections</p> <ul style="list-style-type: none"> <li>• Positions 1 &amp; 2 require either 24 or 115 VAC from a heater control circuit to activate the CPC-3. A factory installed call return jumper wire above each terminal block routes the voltage connected from position 1 to position 3. When the CPC-3 safety circuit is made it switches position 3 to position 4, where the intercepted heater control circuit is routed back to the heater. Positions 3 &amp; 4 can be used independent of positions 1 &amp; 2. If doing so remove the jumper wire above positions 1 and 3.</li> </ul>	<p><b>3</b></p> <p>Details Page 3 Fig. Aa</p>
	<p><b>Verify: 24-115V</b>Appliance Interlock Jumper Position</p> <p><b>IMPORTANT:</b> Each six position terminal block includes a RED jumper tab to select the heater interlock voltage that is connected heater interlock terminal block. Place RED jumper tab in Dry for positions A &amp; B, 24V or 115V for positions 1 &amp; 2 depending upon heater interlock voltage</p>	<p><b>4</b></p> <p>Details Page 3 Fig. Aa</p>
	<p><b>Verify: EXP-4E Expansion Modules</b></p> <ul style="list-style-type: none"> <li>• <b>Communications Connections</b></li> <li>• <b>Supply Power to the accessory Expansion Board</b></li> </ul>	<p><b>5</b></p>

**CPC-3 MAIN POWER INPUT WIRING & HEATER INTERLOCK WIRING**



**HEATER INTERLOCK CALL METHODS**

If using the "Dry" call method, place the RED jumper tab in the "DRY" position. Remove the Wire Call Jumper that routes voltage from terminal 1 to 3.

If using the "Voltage Call Method", place the RED jumper tab in either the 24V or 115V position depending upon heater interlock voltage.

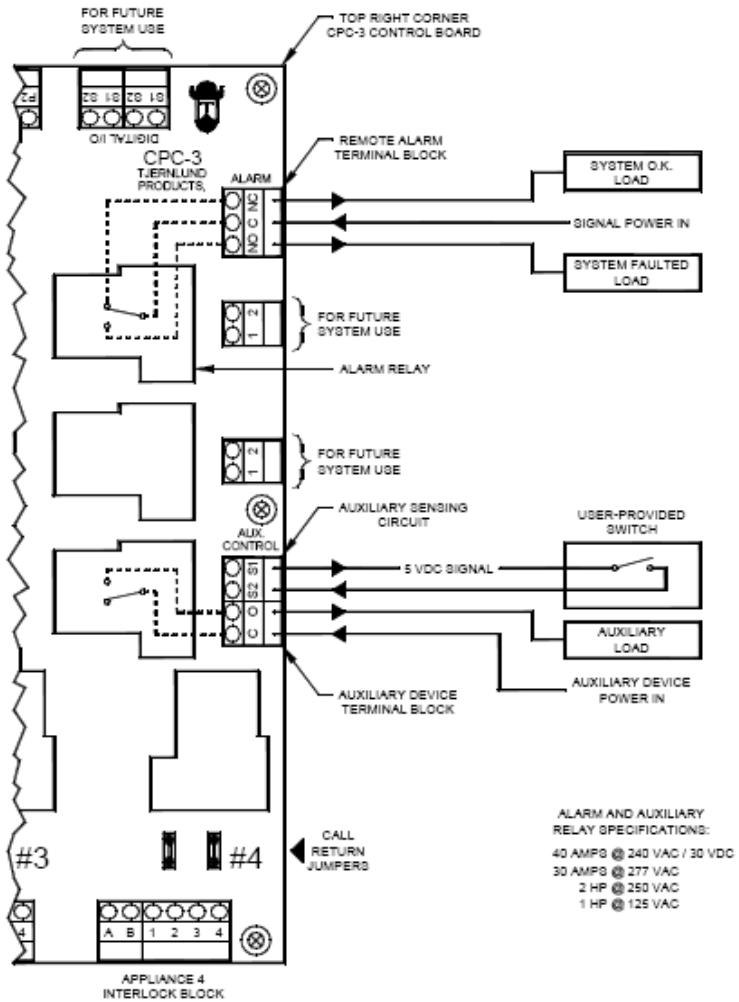
The Wire Call Jumper routes the "voltage" hot call signal from the #1 position to the #3 position. When the CPC-3 safety relay closes, this voltage is routed to position #4 and the interlocked burner.

If activating the CPC-3 with a different call voltage than that of the interlocked burner run signal, remove the Wire Call Jumper and provide the controlled voltage to position #3.

Installer Check	Accessory Item <i>(details Page 4, Fig. B)</i>	Description
	<p><b>Remote Alarm Terminals:</b> Used to activate a remote alarm through either normally open or normally closed contacts. A power source is routed to the C position and returned out of either the N/C or N/O positions if an alarm condition exists.</p>	
	<p><b>Auxiliary Device Terminals:</b> Used to activate a motorized damper/louver in series with the inducer/blower activation by switching power to device through terminal C &amp; O. Position S1 outputs 5 VDC to be switched through a damper end switch and returned to position S2. This incorporates the end switch closure into the overall CPC-3 safety circuit. Positions S1 &amp; S2 may also be used to react to the contact closure of a carbon monoxide alarm. The functions of C &amp; O and S1 &amp; S2 are independently activated through the Auxiliary Device key.</p>	
	Secondary AC Power Supply	
	VFD Step-down Transformer	
	EXP-4E Appliance Expansion kit	

**REMOTE ALARM / AUXILIARY DEVICE WIRING**

**Fig. B**



## AUXILIARY DEVICES

The CPC-3 Auxiliary Devices include an Audible Alarm Buzzer (on the board), an Auxiliary Sensor Circuit (Blue terminal S1 and S2) and Auxiliary Device Relay (Green terminal C and O). Due to the different ways a relay and a sensor can be used, auxiliary device options have been created with specific applications in mind. To set any of the auxiliary devices, the Key Pad must first be unlocked. With the key pad unlocked, press the AUXILIARY DEVICE key. Use the INCREASE and DECREASE to scroll through the available options. Once at the desired option, press the ENTER key to enter the desired option. Using the INCREASE and DECREASE keys will scroll through the available menu in each option. Press the SAVE SETTING key to change any option. To exit the Auxiliary Device Menu, press the AUXILIARY DEVICE key. Each programmable option is described in detail below.

### ALARM BUZZER

Pressing the SAVE SETTING key will change whether this option is "On" or "Off". If the alarm buzzer is "On", the board-mounted buzzer will sound anytime the CPC-3 control detects a System Fault. NOTE: The on-board Alarm relay will change state during a System Fault regardless of the condition of the alarm buzzer. The factory default setting for the alarm buzzer is "Off".

### AUX SENSOR SETUP

There are 3 programmable conditions for the Auxiliary Sensor. To view these 3 options, press the ENTER key to enter the Aux Sensor menu. Once the Enter Key is pressed, the bottom line becomes active and will display the current setting. To change this option, use the INCREASE and DECREASE keys to scroll through the available options. When the desired option is visible, press the SAVE SETTING key to save the option. The available Sensor options are listed below.

NONE: With "None" selected, the Auxiliary sensor is turned off and is not used by the CPC-3 control. This is the factory default setting for the Auxiliary Sensor.

### COMB. LOUVER

This sensor option is to be used with a switch that is sensed closed after a call for heat is established to the CPC-3 control. Once a call for heat is recognized, the sensor circuit is given 90 seconds to close. This option is often used with Motorized Combustion Air Louvers that include an end switch. The end switch is wired to the AUX. CONTROL, S1 and S2 terminals. The CPC-3 control sends out a signal on S1 and reads the signal back on S2. If the signal is not available within 75 seconds, a fault will occur. If a Sensor Fault occurs, all heating heaters will be shut off and the control will go into a fault state. See "Viewing and Resetting Fault History" page 16.

### CO DETECTOR

The CO Detector sensor option is designed to be used with normally closed contacts of a CO Detector. When this option is activated, it immediately starts to operate and the Aux Control S1 to S2 circuit needs to be closed within 20 seconds or a "Sensor Fault" will be issued. This option is operational at all times and does not need to have a call for heat to be active.

### AUX DEVICE SETUP

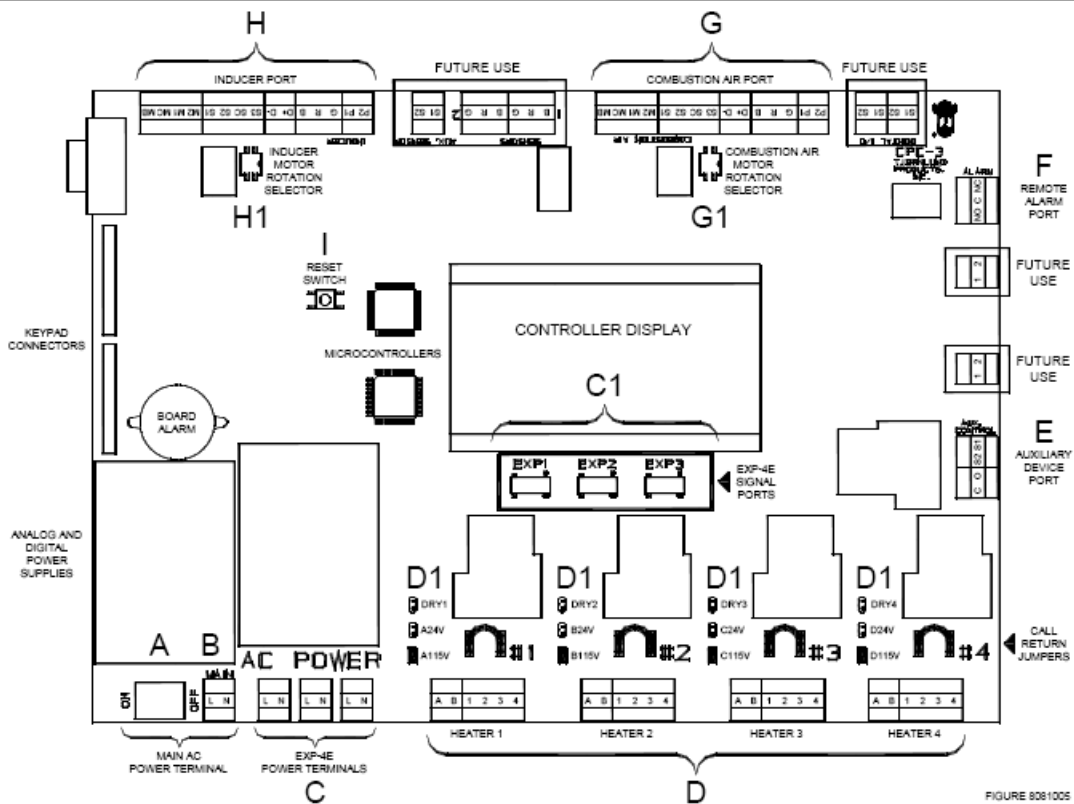
This is the Relay portion of the auxiliary options and is used to set up the relay's operational characteristics. To view the Aux Device menu, press the ENTER key. Once the menu is active, the bottom line of the display will be viewable and the current setting will be stated. To view additional options, use the INCREASE and DECREASE keys. To save a menu option, press the SAVE SETTING key while the option is visible. To exit from the Device menu press the ENTER key. To exit from the Auxiliary options, press the AUXILIARY DEVICE key. A list of the Aux Device options and how they work is listed below.

NONE: With "None" selected, the Auxiliary Device is turned off and is not used by the CPC-3 control. This is the factory default setting for the Auxiliary Device.

### COMB. LOUVER

This device option was developed with external loads in mind. A maximum of 1 HP can be routed through the Aux Control C and O terminals. These contacts are typically used to drive a motorized louver motor. If this option is selected, when a call for heat is recognized by the CPC-3 control, this relay will close and will remain closed until the call for heat is removed and post purge is timed out.

## CPC-3 BOARD CALLOUTS



**A) CPC-3 Main Power Switch**

**B) Power Supply Input Terminals:** Accepts either 115 or 230 VAC, 50/60 Hz. 230V power can be supplied from VFD L & L Terminals.

**C) Power Supply Output Terminals:** Supply power to accessory EXP-4E Expansion boards.

**C1) EXP-4E Expansion Modules:** Communications connections from EXP-4E Expansion boards.

**D) Heater Interlock Terminal Blocks (Four):**

Positions A & B are for dry contact actuation, with A outputting 5 VDC and B needing 5 VDC to activate the CPC-3. Positions 1 & 2 require either 24 or 115 VAC from a heater control circuit to activate the CPC-3. A factory installed call return jumper wire above each terminal block routes the voltage connected from position 1 to position 3. When the CPC-3 safety circuit is made it switches position 3 to position 4, where the intercepted heater control circuit is routed back to the heater. Positions 3 & 4 are used independent of positions 1 & 2. If the A & B dry contacts are used to activate the CPC-3 (Call return jumper wire must be removed).

**D1) IMPORTANT:** Each six position terminal block includes a RED jumper tab to select the heater interlock voltage that is connected heater terminal block. Place RED jumper tab in Dry for positions A & B, 24V or 115V for positions 1 & 2 depending upon heater interlock voltage)

**E) Auxiliary Device Terminals:** Used to activate a motorized damper/louwer in series with the inducer/blower activation by switching power to device through terminal C & O. Position S1 outputs 5 VDC to be switched through a damper end switch and returned to position S2. This incorporates the end switch closure into the overall CPC-3 safety circuit. Positions S1 & S2 may also be used to react to the contact closure of a carbon monoxide alarm. The functions of C & O and S1 & S2 are independently activated through the Auxiliary Device key.

**F) Remote Alarm Terminals:** Used to activate a remote alarm through either normally open or normally closed contacts. A power source is routed to the C position and returned out of either the N/C or N/O positions if an alarm condition exists.

**G & H) Draft and Combustion Air Terminals:** The CPC-3 can independently control mechanical draft and combustion air inducers/blowers. While the software that runs these functions differs, the communications to the VFD's that control the inducer/blower is identical. The following information is applicable to both the Inducer and Combustion Air terminal strips.

Positions P1 & P2 are for the PSA-1, manual mode proving switch. Position P1 outputs a 5 VDC signal to the PSA-1 Proving Switch. When the switch closes it returns the signal to position P2, allowing interlocked heaters to operate with the CPC-3 in Manual Mode.

Positions G, R & B connect to a TD-Series transducer. Position G receives the 1-10 VDC output from the transducer.

Position R is the 24 VDC power supply to the transducer. Position B is the ground for the transducer. Positions D+ & D- connect to the VFD through the included communications cable. Position D+ outputs a 1-10 VDC signal to the VFD to modulate the inducer/blower. Position D- is the reference ground.

Positions S3, SC, S2 and S1 connect to the VFD through the included communications cable. These connections enable reset of a faulted VFD and reverse the rotation of an inducer/blower from the CPC-3 controller.

Positions M1, M2, MC and MB connect to the VFD through the included communications cable. Position M1 outputs a 5 VDC signal to the inducer/blower limit circuits. This signal must return to position M2 or a mechanical fault will be posted on the display and the Limit Status OK LED will not be lit. Position MC outputs a 5 VDC signal to a N/C fault relay within the VFD. This signal must return to position MB or a VFD fault will be noted in the display and the VFD Status OK Green LED will not be lit.

**G1 & H1) Inducer / C.A. Blower Rotation Selectors:**  
Below the Inducer (Draft) and Combustion Air terminal strips are two sets of dip switches. These dip switches determine the rotation of the inducer/blower being controlled by that particular terminal strip. The two dip switches at each position must always be switched opposite of each other or the VFD will receive simultaneous FWD/REV run commands, causing it to fault. See "Checking Rotation", page 12.

**I) CPC-3 Reset Button:**  
Pressing this button resets the CPC-3 controller with a "soft boot". It can be used in lieu of the power switch to "re-boot" the microcontrollers of the CPC-3 without power spiking the board.